

CLAIM AMENDMENTS

Please cancel claims 2, 5, 8 and 23-33, and amend claims 1, 3, 4, 6, 7 and 9-22 and add new claims 34 and 35 as follows:

1. (Currently amended) A method of forming ~~an inorganic compound a solid of a ferroelectric or a high dielectric material~~ by calcining organic compounds containing metal elements, comprising:

a step of forming a film by coating over a substrate a solution of an organic compound material containing a metal element;

an organic substance removing step of removing organic substances from the film by applying an organic substance removing treatment that uses means other than heat to the organic compound material containing the metal elements, thereby obtaining ~~an~~ inorganic compound material; and

a crystallizing step of calcining to crystallize said the inorganic compound material obtained in said organic substance removing step, thereby obtaining an inorganic compound a solid of a ferroelectric or a high dielectric material;

the organic substance removing step including a depressurizing step of placing the organic compound material in a low-pressure atmosphere and a heat treatment step of heating the organic compound material at a temperature at

AMENDMENT

(09/856,818)

which the organic compound material does not crystallize, the depressurizing step and the heat treatment step being performed simultaneously.

2. (Canceled)

3. (Currently amended) The method of forming an inorganic compound a solid of a ferroelectric or a high dielectric material according to Claim [[2]] 1, wherein said crystallizing step is carried out after said depressurizing step.

4. (Currently amended) The method of forming an inorganic compound a solid of a ferroelectric or a high dielectric material according to Claim [[2]] 1, wherein said depressurizing step and crystallizing step are carried out simultaneously by calcining said the organic compound material in the low-pressure atmosphere.

5. (Canceled)

6. (Currently amended) A The method of forming an inorganic compound a solid of a ferroelectric or a high dielectric material according to Claim 5, wherein

said step of giving energy other than heat includes by calcining organic compounds containing metal elements, comprising:

a step of forming a film by coating over a substrate a solution of an organic compound material containing a metal element;

an organic substance removing step of removing organic substances from the film by applying an organic substance removing treatment to the organic compound material containing metal element, thereby obtaining an inorganic compound material; and

a crystallizing step of calcining to crystallize the inorganic compound material obtained in said organic substance removing step, thereby obtaining a solid of a ferroelectric or a high dielectric material;

the organic substance removing step including an electromagnetic wave supplying step of supplying an electromagnetic wave to said the organic compound material and a heat treatment step of heating the organic compound material at a temperature at which the organic compound material does not crystallize, the electromagnetic wave supplying step and the heat treatment step being performed simultaneously.

7. (Currently amended) A.[The] method of forming an inorganic compound

AMENDMENT

(09/856,818)

a solid of a ferroelectric or a high dielectric material according to Claim 5, wherein
said step of giving energy other than heat includes by calcining organic
compounds containing metal elements, comprising:

a step of forming a film by coating over a substrate a solution of an organic
compound material containing a metal element;

an organic substance removing step of removing organic substances from
the film by applying an organic substance removing treatment to the organic
compound material containing a metal element, thereby obtaining an inorganic
compound material; and

a crystallizing step of calcining to crystallize the inorganic compound
material obtained in said organic substance removing step, thereby obtaining a
solid of a ferroelectric or a high dielectric material;

the organic substance removing step including a step of treating said the
organic compound materials with activated oxygen particles and a heat treatment
step of heating the organic compound material at a temperature at which the
organic compound material does not crystallize, the activated oxygen particle
treatment step and the heat treatment step being performed simultaneously.

8. (Cancelled)

9. (Currently amended) The method of forming an inorganic compound a solid of a ferroelectric or a high dielectric material according to ~~Claim 5~~, wherein said step of giving energy other than heat includes according to claim 1, wherein said inorganic compound the solid of a ferroelectric or a high dielectric material is a complex oxide.

10. (Currently amended) A method of manufacturing a semiconductor device, comprising a step of forming, on a semiconductor substrate, a functional thin film made of an inorganic compound a solid of a ferroelectric or a high dielectric material formed by the method according to claim 1.

11. (Currently amended) The method of manufacturing a semiconductor device according to Claim 10, further comprising:

 a restoring step of restoring characteristics deterioration of said the functional thin film caused by influences in a step carried out after said the functional thin film is formed,

 said restoring step including:

 a treatment step of giving energy other than heat to said the functional thin film; and

a heat treatment step of giving thermal energy to said the functional thin film.

12. (Currently amended) The method of manufacturing a semiconductor device according to Claim 11, wherein said restoring step further includes an oxygen introducing step of introducing an oxidation gas to a surface of said the semiconductor substrate having formed thereon said the functional thin film.

13. (Currently amended) The method of manufacturing a semiconductor device according to Claim 11, wherein said treatment step of giving energy other than heat to said the functional thin film includes an oxygen activated particle treatment step of placing said the semiconductor substrate having formed thereon said the functional thin film in an oxygen activated particle atmosphere.

14. (Currently amended) The method of manufacturing a semiconductor device according to claim 11, wherein said treatment step of giving energy other than heat to said the functional thin film includes an electromagnetic wave supplying step of supplying an electromagnetic wave to said the functional thin film.

15. (Currently amended) The method of manufacturing a semiconductor device according to claim 11, further comprising a wire forming step of forming a wiring on ~~said the~~ semiconductor substrate before said restoring step.

16. (Currently amended) The method of manufacturing a semiconductor device according to Claim 15, wherein said heat treatment step is carried out such that a temperature of ~~said the~~ semiconductor substrate does not exceed a certain temperature predetermined so as not to deteriorate ~~said the~~ wiring.

17. (Currently amended) The method of manufacturing a semiconductor device according to claim 11, further comprising an element forming step of forming a functional element on ~~said the~~ semiconductor substrate before said restoring step.

18. (Currently amended) The method of manufacturing a semiconductor device according to Claim 17, wherein said heat treatment step is carried out such that a temperature of ~~said~~ semiconductor substrate does not exceed a certain temperature predetermined so as not to deteriorate ~~said the~~ functional element.

19. (Currently amended) The method of manufacturing a semiconductor device according to claim 10, comprising an element forming step of forming a functional element on said the semiconductor substrate before said step of forming said the functional thin film.

20. (Currently amended) The method of manufacturing a semiconductor device according to Claim 19, wherein said crystallizing step is carried out at or below a certain temperature predetermined so as not to deteriorate characteristics of said the functional element.

21. (Currently amended) The method of manufacturing a semiconductor device according to claim 10, wherein said crystallizing step is carried out at a predetermined temperature lower than a temperature, at or above which mutual-diffusion of materials occurs between said the functional thin film and a solid adjacent thereto.

22. (Currently amended) The method of manufacturing a semiconductor device according to claim 10, wherein:

said the functional thin film is a ferroelectric thin film; and

~~said the~~ semiconductor device is a ferroelectric storage device employing
~~said the~~ ferroelectric thin film as a charge holding film.

Claims 23-33 (canceled)

34. (New) The method of forming a solid of a ferroelectric or a high dielectric material according to Claim 1, wherein said step of forming the film includes a step of performing precalcining after the solution coated on the substrate is dried.

35. (New) The method of forming a solid of a ferroelectric or a high dielectric material according to Claim 7, wherein the activated oxygen particles include oxygen radical.